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DESCRIPTION AMPLIFICATION OF MIKANIA PLATYLOBA URBAN & EKMAN AND REPORT OF BILABIATE FLOWERS IN THE GENUS

Walter C. Holmes

Holmes, Walter C. (Department of Biology, Baylor University, Waco, Texas 76798-7388 U.S.A.) Description Amplification of *Mikania platyloba* Urban & Ekman and Report of Bilabiate Flowers in the Genus. Moscosoa 8: 27-32. 1994. The description of Mikania platyloba, a species described from sterile material, is amplified and accompanied by an illustration. The species is remarkable in that it is the only known species of the genus with bilabiate flowers.

Mikania platyloba fue descrita a partir de material estéril. Esta descripción es ampliada y acompañada por una ilustración. La especie es muy notable, ya que es la única *Mikania*, conocida hasta ahora, con flores bilabiadas.

The plant known as *Mikania platyloba* Urban & Ekman was described from sterile material collected in 1929. Apparently, it was proposed as new because it has compound leaves, an exceedingly rare condition in *Mikania*. In my recent treatment of the genus for the Greater Antilles (Holmes 1993), I left the disposition of this species in an "unresolved" status. At the time, this action was appropriate because the fundamental characteristic used in Mikania classification and delineation are the nature of the capitulescence, subinvolucral bracts, phyllaries and flowers (principally the relative lengths of the tube, throat, and teeth, the shape of the throat, and nature of the veins of the teeth). Proposal of a new species without reference to these traits can only be considered as conditional at best. Except for the very abundant species, *Mikania*, even in the fertile condition, are often difficult to identify because of the large number of species (ca. 430) and existence of several species complexes composed of members having exceptionally widespread distributions. *Mikania platyloba*, as described by Urban and Ekman, seemed scarcely distinguishable from the other two compound-leaved species known from Hispaniola and from similar species from extra-territorial areas, such as *Mikania ulei* Hieron of southeastern Brazil. While it is not likely that a species could have such a distribution patterns, inferring such factors must be considered in monographic studies. Comparison of leaves of *M. platyloba* with those of similar species was inconclusive because the leaves were from different positions on the plants and of different relative ages. This involved comparison of the lower cauline leaves of the sterile *M. platyloba* with the bracteal leaves among the capitulescence of other species, since lower stem leaves are only occasionally present of herbarium specimens possessing fertile material.

Particularly common in *Mikania* is dimorphic foliage in which the cauline leaves differ greatly from those among the capitulescence in size, shape, bases, lateral basal lobing, texture, and, in parted-leaved species, the nature and disposition of the lobes or leaflets.

The outcome was that the limited material available for study (two isotypes from S), did not provide enough data to render a clear decision. Since it was not possible to provide adequate diagnosis of the plant and I was not willing to place it in the synonymy of another species, the issue was best left unresolved, pending acquisition of additional materials.

The recent collection of a *Mikania* species (*García et al 5279*) by personnel of the herbarium of the Jardín Botánico Nacional Dr. Rafael M. Moscoso has apparently permitted resolution of this problem. The leaves of this specimen appear nearly identical to those of *Mikania platyloba* and to the short diagnosis provided by Urban and Ekman, specially when allowances are made for differences in the ages of the plants and location of the vegetative structures. Additionally, both collections are from the same location and nearly the same elevation, adding further support. It must be mentioned, however, that with the materials available for study, there will always remain some uncertainty as to the exact nature of the type of *M. platyloba*. It remains possible, though unlikely, that the plant proposed as *M. platyloba* could have reproductive structures of a totally different nature than the described below or perhaps be a species of a different genus. For example, the leaves and stems of several vining *Valeriana* (Valerianaceae) closely resemble those of the genus *Mikania*. However, the evidence amply supports that the mentioned recent collection is best considered conspecific with the sterile type material of *M. platyloba*.

Thus, it is now possible to amplify the description of *Mikania platyloba*.

Mikania platyloba Urban & Ekman, Ark. Bot. 23 A(11): 72. 1931, descr. ampl. (Fig. 1).

Twining vine. Stems terete, brownish to green, hirsute-hispid with brownish-purple jointed hairs; internodes 4-13 cm above and to 20 cm below. Leaf blades trifoliolate, ovate to triangular deltate to deltate in contour, 4-7 x 5-9 cm, terminal leaflet ovate, 2.7-3.5 cm, pinnately nerved, apices rounded, margins, entire to more often trifoliolately lobed, the lobes rounded, petiolules ca. 1 cm. long, hispid-hirsute; lateral leaflets ovate ca. 2 x 1.7 cm, pinnately nerved, margins prominently lobed to often trifoliolate, the lobes rounded, petiolules ca. 1 cm long; upper surfaces finely puberulent and sparingly glandular, lower surfaces rather densely hirsute-hispid, densely glandular; petioles 1.5-3 cm long, densely hirsute-hispid; nodes with stipule-like ridges as wide as the stem and ca. 1 mm long. Capitulescence a cymosely disposed, flat topped, compound corymb, 8-12 cm wide and ca. 5 cm tall; branchlets

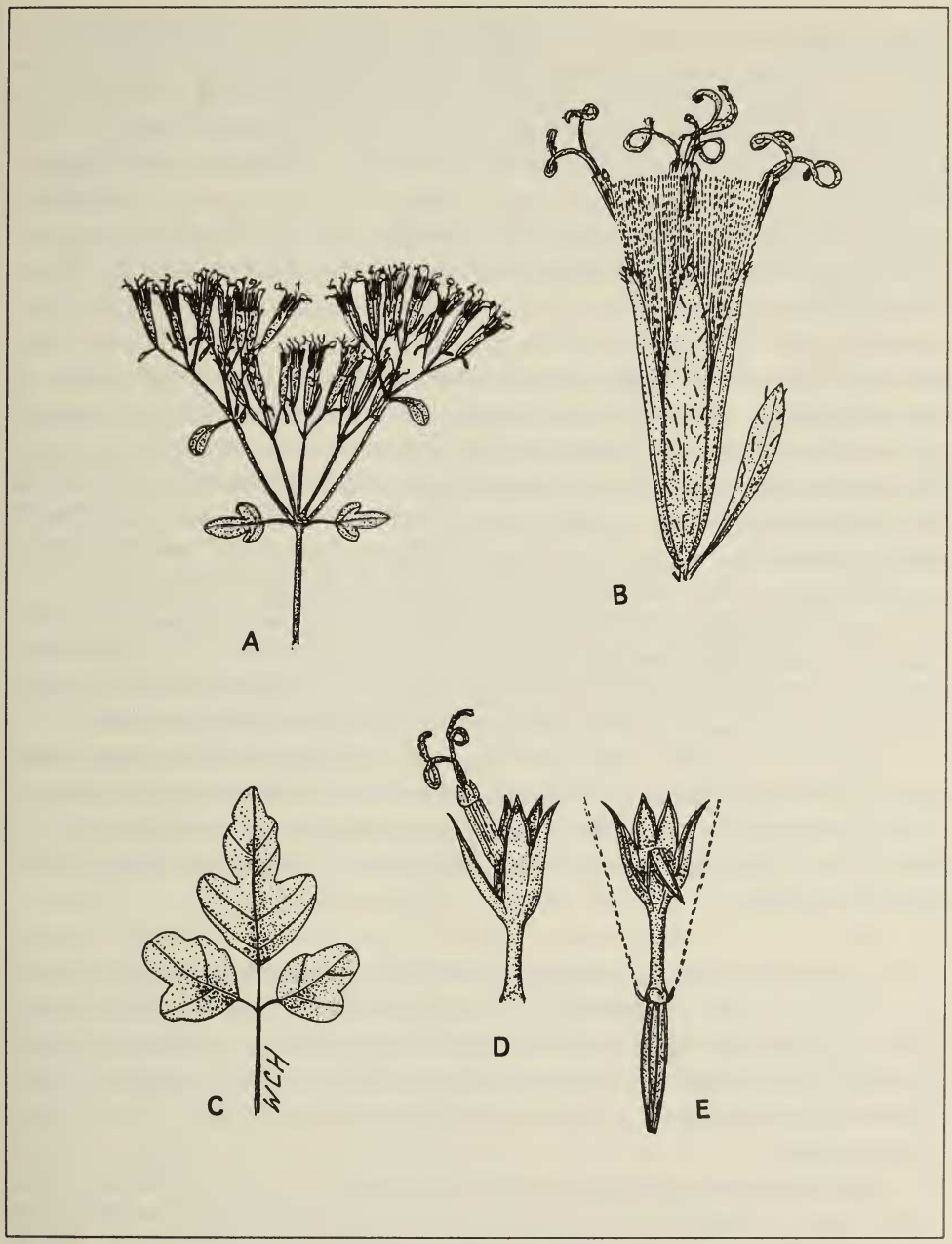

Fig. 1. *Mikania platyloba* Urban & Ekman. A. capitulescence; B. head showing phyllaries and subinvolucral bract; C. leaf; D. corolla (side view), showing anthers leaning over peripheral tooth; E. corolla (peripheral view) with tooth drawn as bent to allow illustration of abaxial teeth, pappus (only two of the 45-55 present drawn), and achene.

terete, densely hispid-hirsute with jointed hairs; bracts ovate, simple to trifoliolate, otherwise similar to leaves; ultimate branchlets 2-8 mm long, pilose to hispid-hirsute with jointed hairs. Heads 9-11 mm long. Subinvolucral bracts linear to oblanceolate to sometimes spatulate, 5-7 mm long, apices acute to rounded, margins entire, surfaces pilose-hirsute with jointed hairs, sparingly glandular, nerves obscure. Phyllaries linear-oblong, ca. 7 mm long, obscurely nerved, the outer pair pilose-hirsute with jointed hairs, the inner glabrate except for the puberulent rounded to acute apices. Corollas yellowish-green, bilabiate, 5.5-6 mm long, tube ca. 2.8 mm long, throat turbinate to cupiliform, varying in length (in one floret) from 0.7-2.7 mm, depending upon the amount of cutting present (which forms the corolla teeth), teeth all reaching the same height, longest corolla tooth disposed adaxially, linear to linear-lanceolate, ca. 2.7 mm long, equally cut on both sides, the other four teeth asymmetrical because of unequal cutting on either side of the tooth, the two medial (lateral) teeth cut ca. 2.7 mm at the adaxial side (adjacent to adaxial tooth) and ca. 2 mm at abaxial side, the two abaxial (inner) teeth cut ca. 2 mm at side adjacent to medial teeth and ca. 0.7 mm where they join. Pappus bristles ca. 5 mm long, 45-55, margins finely scabrid. Achenes ca. 4.2 mm long, black, surfaces floccose.

Type: Hispaniola. DOMINICAN REPUBLIC, Cordillera Septentrional, prov. Duarte, Loma Quita Espuela, forest, c. 800 m, not common, 25 May 1929, *E. L. Ekman H-12272* (holotype: B (destroyed); isotype: S! (2 specimens; the one with the more numerous leaves is hereby designated as lectotype), BAYLU (photos).

Specimen examined: Dominican Republic. Cordillera Septentrional. Prov. Duarte. Reserva Científica Quita Espuela, carretera hacia la Canella, en el lugar que los lugareños llaman Los Espinos, SE de una antena de radio (19º 24' N, 70º 08' Oeste); 680-700 m, 6 Oct. 1993, *R. García, M. Mejía, F. Jiménez & R. Bastardo 5279* (BAYLU, JBSD).

Vegetatively, *Mikania platyloba* may be distinguished from both *M. dissecta* and *M. tripartita*, the two other species of Hispaniola with compound leaves, by its more pinnately disposed leaflets. The other two species have leaves that are more palmately cleft to palmately compound. *Mikania platyloba* also has bilabiate florets, while the other mentioned species have florets typical of the genus (actinomorphic disc flowers).

Further comments on this subject is provided below. As an aid to identification, a key, modified from Holmes (1993), is provided to the four species of the Greater Antilles with compound leaves (beginning at couplet 16).

A. Heads about 6 mm long, all corolla teeth shorter than the throat.....
.....*M. ranunculifolia*

A. Heads about 10 mm long, corolla teeth as long or longer than the throat or

corollas bilabiate with teeth of varying lengths.....B
B. Corollas bilabiate, teeth length varying.....*M. platyloba.*
B. Corollas actinomorphic (typical disc flower), teeth length equal.....C
C. Capitulescence open; penduncles 5-10 mm long, phyllaries with obtuse to rounded apices; corolla campanulate, the teeth about as long as the throat; stems angular.....*M. tripartita*
C. Capitulescence dense; peduncles 1-3(4) mm long; phyllaries with acute apices; corolla cupiliform, the teeth three times of more longer than the throat; stems terete.....*M. dissecta*

Bilabiate flowers, sometimes referred to as being zygomorphic, are of sporadic occurrence in the Eupatorieae (Jeffrey 1977). King and Robinson (1987) report them as occurring in *Eitenia*, *Lomatozona*, *Praxeliopsis*, *Microspermun*, and several other genera, all having heads with numerous florets (the number may vary from 8 to 150 or more, but is generally considerably more than 8). In the Eupatorieae, such bilabiate florets are always peripheral, have their expanded lobes marginally disposed, and following Jefrey's (1977) evolutionary relationships of corolla types in the Compositae would be designate as either 4 + 1 or 2 + 3, depending on the number of inner (first number) or outer (second number) lobes. The inner (non-marginal) florets are always typical actinomorphic disc flowers characteristic of the tribe. The trend apparent is that these bilabiate flowers are ray-like in appearance and function in attraction of pollinators.

The bilabiate corolla condition in *Mikania platyloba* is noticeably distinct from that described above in several features. All *Mikania* have four florets per head, each borne opposite one of the four phyllaries. Thus in all *Mikania*, each floret is peripheral, and in *M. platyloba* each is bilabiate. None of the lobes is expanded (greater in length or width than the others) or disproportional in size. Rather, the bilabiate conditions is caused by differential amounts of cutting of the corolla teeth into the throat, hence, all teeth reach the same height above the corolla tube. The peripheral (adaxial) tooth is symmetrical, the margins being equal in length and cut nearly to the tube. The remaining four teeth are asymmetrical because of differential lengths of the margins. The two lateral teeth are mirror images, have their adaxial margins as deeply cut as the peripheral tooth while their abaxial margins are cut nearly one millimeter less. The two inner (abaxial) teeth are also mirror images and have their more lateral margins (those adjoining the lateral teeth) cut the same amount as the lateral teeth, while the inner margins, which are adjacent, are cut slightly less than one millimeter. Thus there is a gradual reduction in cutting from the periphery to the inner teeth. Under the Jeffrey system cited above, the corolla would be 4+1 (four inner teeth and one outer tooth). However, the orientation of the teeth

and prominent difference in the length of the margins would suggest a 2+2+1 arrangement, which is not listed as a corolla type.

As with dioecy in the *Mikania swartziana* complex (Holmes 1991), the Bilabiate condition in *M. platyloba* appears related to the evolution of the species on the island and isolation on the periphery of the distribution of the genus. It may be considered as removed from the major trends of evolution within the group. That no corolla teeth are disproportional in size seems to indicate that its function is not attraction of pollinators. *Mikania*, with its constant and low number of florets per head, gained attraction and countered the low head number by an extraordinary proliferation of the number of heads into inflorescences of a secondary nature (conflorescences). The function of the bilabiate condition may instead be related to pollination. The anthers of *Mikania* are characteristically well exserted from the corolla throat at anthesis. A trend among many *Mikania* is the deep cutting into the corolla throat by the teeth, presumably, enhancing the exsertion of the anthers. The deep cutting of the peripheral teeth in *M. platyloba* seems to also enhance anther exsertion by permitting the anthers (and stigmatic appendages) to lean adaxillary outward rather than have the filament apparatus elongate beyond the corolla throat. This suggests a relationship with special pollinator or perhaps may be a mechanism of orienting or separating the anthers and stigmatic appendages of the flowers to hinder pollination by flowers of the same head.

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